



Maritime Safety & Security Information System

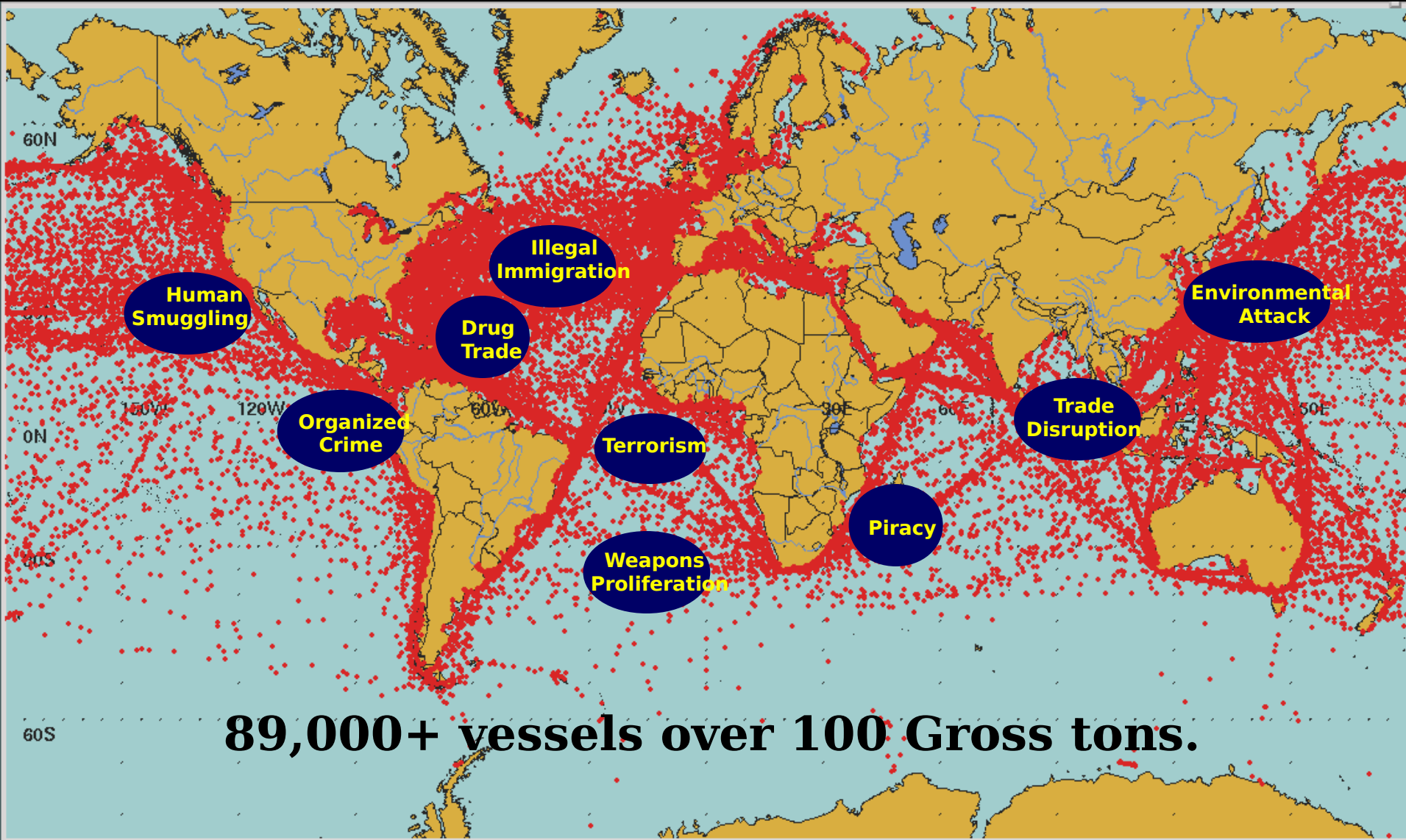
09/02/16



U.S. Department of Transportation
Research and Innovative Technology Administration

***Enabling Global
Maritime
Situational
Awareness***

Maritime Situational Awareness



Common Maritime Challenges

Organized crime

Piracy

Drug smuggling

**Human smuggling and
slavery**

**Illegal weapons
movement/proliferation**

Terrorism

**Exclusive Economic Zone
(resource) exploitation**

Illegal fishing

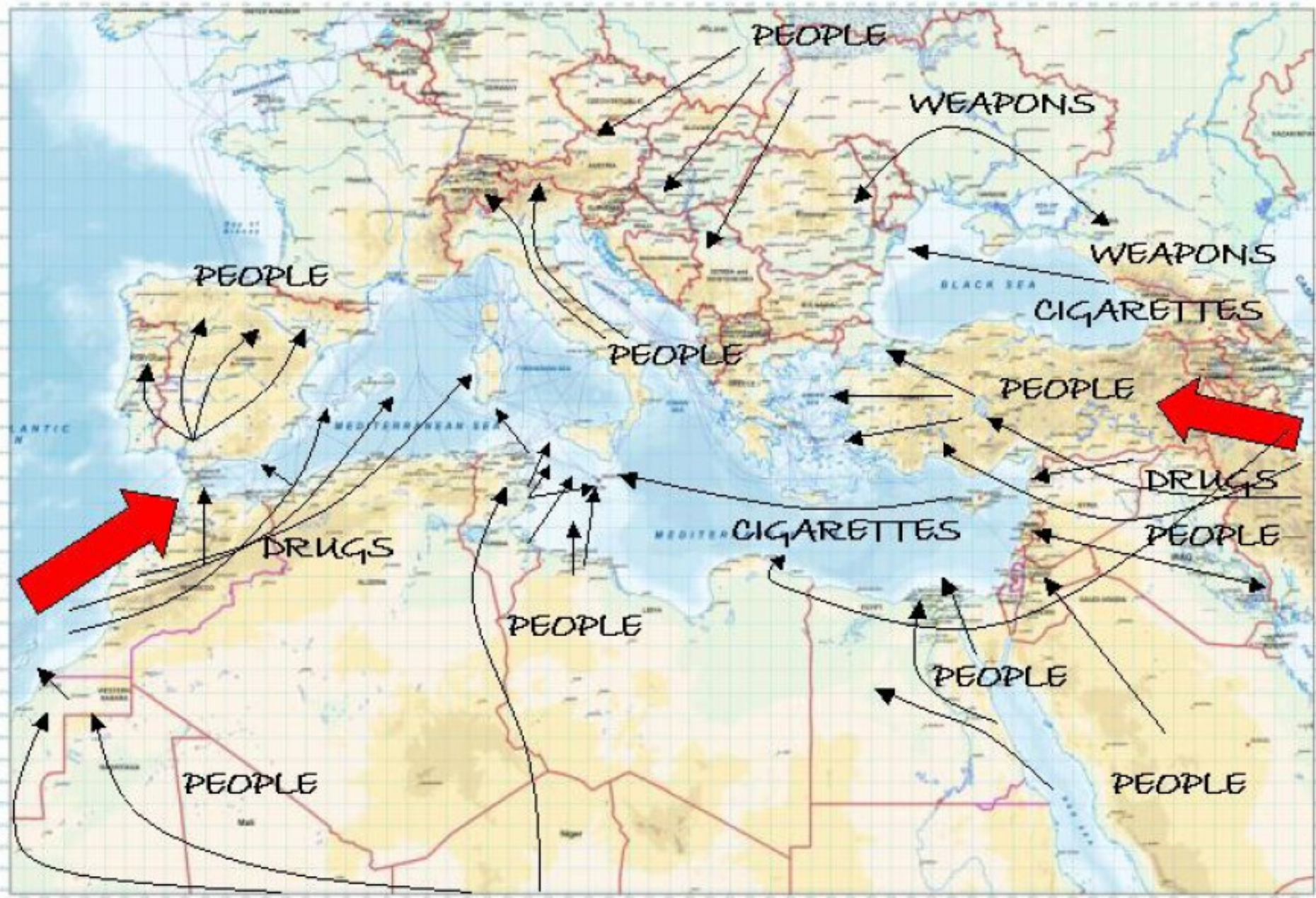
Trade disruption

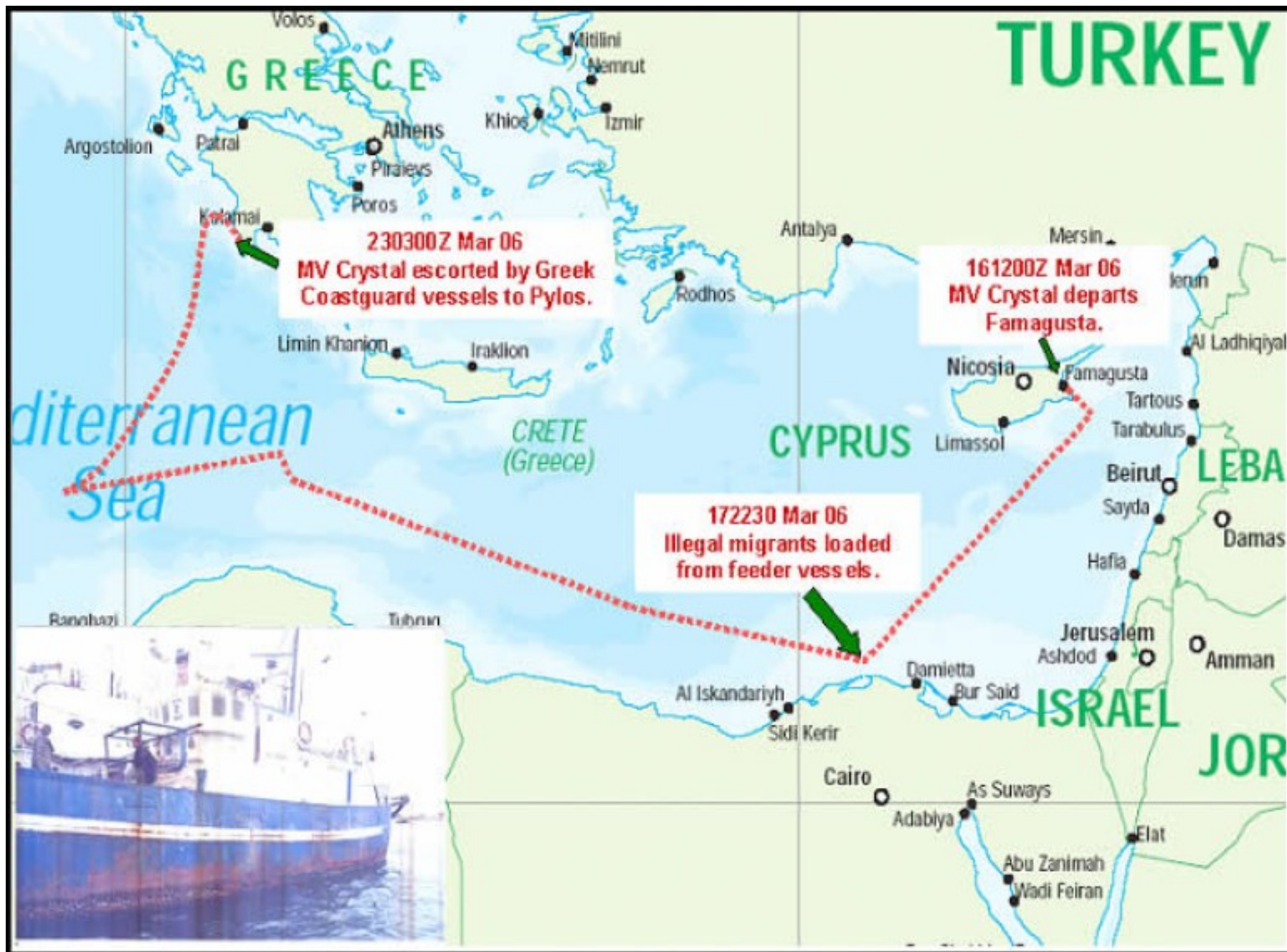
Illegal migration

Search and Rescue

Environmental issues

***Nations find their well-being challenged by
these common maritime issues.***





MDA Guiding Principles

- MDA is fundamental to maritime security – a common interest.
- Proliferate AIS. Apply the air safety/policing model. AIS = IFF at sea.
- It's ALL about the network – leverage the internet.
- Be transparent - share information widely.
- Work interagency.
- Be inclusive - invite new partners, and not just navies – coast guards, shipping and insurance companies, and international organizations all have a role.
- Provide an incentive to join – safety, economic, and security benefits.
- Keep it UNCLASSIFIED – needless classification only weakens network.

MSSIS

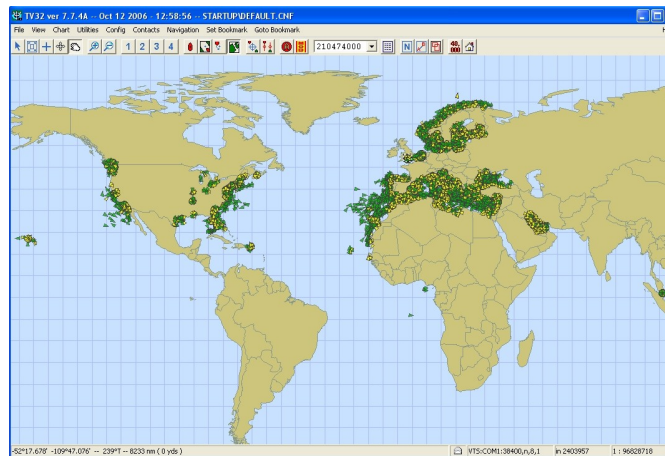
Maritime Safety & Security Information System

Conceived by the U.S. Department of Transportation, NATO, and US Navy as an:

Unclassified, multinational, freely shared, Automatic Identification System (AIS) network

The MSSIS provides clients with real-time AIS data derived from shore side, waterborne, and airborne platforms.

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The MSSIS Encourages Participation by all countries through data sharing in order to achieve the universal goal of a safer, more secure, global marine environment.

MSSIS: Timeline

- **September 2005** – Demonstration of proposed AIS network, links the ports of Rota, Spain and Souda Bay, Greece. Concept presented to U.S. Navy Sixth Fleet Commander (C6F) and NATO representatives.
- **November 2005** – The Volpe Center continues demonstration for C6F and NATO aggregating feeds from NATO AIS systems in the Mediterranean (coastal systems in Spain, Italy, Greece, Turkey, and shipboard systems). A single desktop computer in Cambridge, MA acts as the network backbone.
- **March 2006** – Kick off meeting and start of the Maritime Safety and Security Information System. Design of the eventual network commences while the demonstration network continues to operate
- **August 2006** – Transition from the demonstration system to the operational MSSIS design laid out over the course of the summer. MSSIS servers at Cambridge, MA operational

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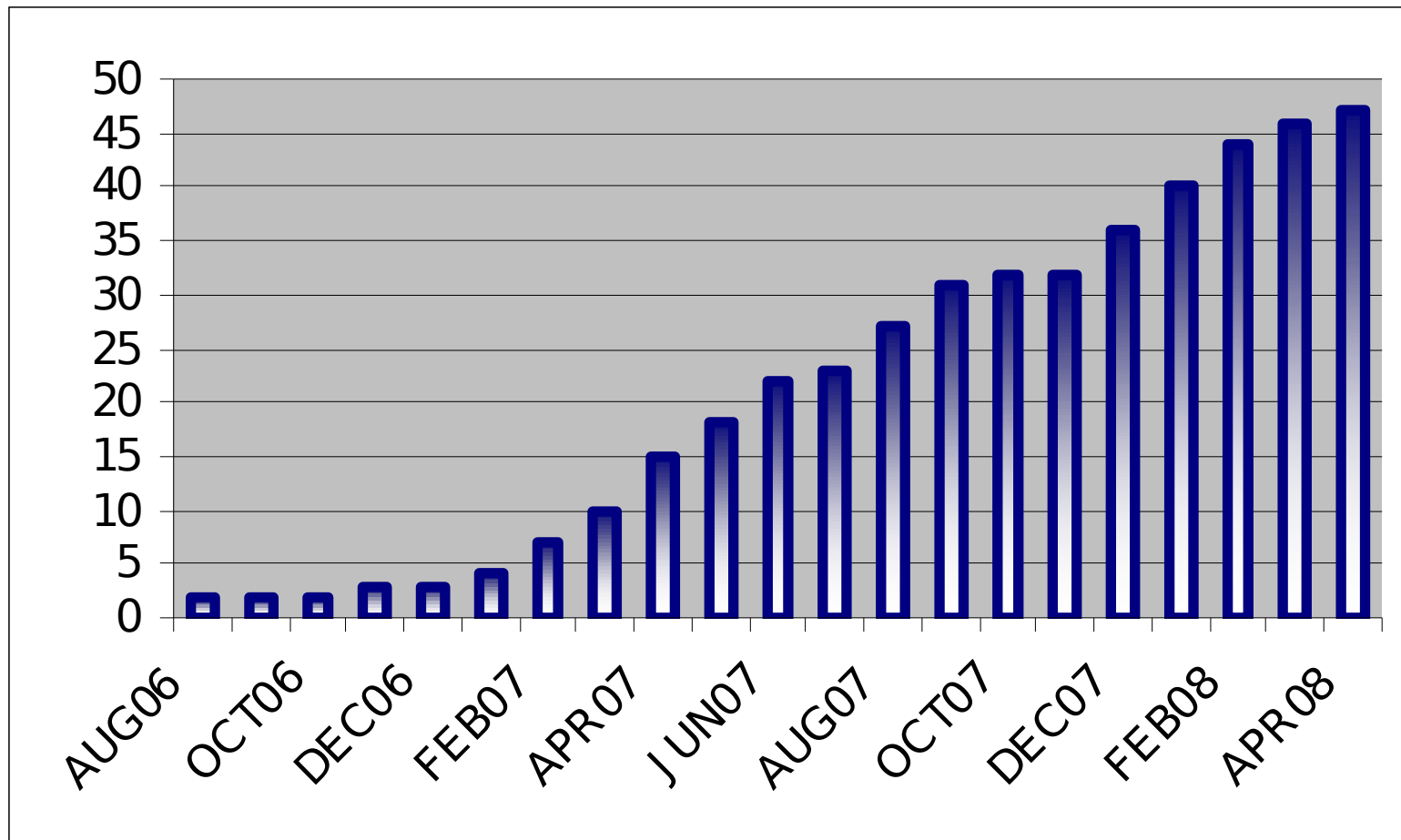
MSSIS: Timeline

- **September 2006** – Turkey, Greece, Spain officially join MSSIS
- **October 2006** – USA officially joins MSSIS
- **December 2006** – MSSIS servers installed at Norfolk, VA
- **March 2007** – MSSIS servers installed at US Sixth Fleet HQ, Naples, Italy
- **December 2007** – MSSIS servers installed at NATO Command Component Maritime HQ, Naples Italy. At a Maritime Domain Awareness conference in Santiago Chile, a panel of South American navy admirals recommend joining MSSIS.
- **February 2008** – Middle East and Arabian Gulf nations are introduced to MSSIS at the Maritime Infrastructure Protection Symposium in Bahrain.
- **April 2008** – MSSIS has over 50 member nations.

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MSSIS: Country Participation



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MSSIS Participating Countries

Albania

Australia

Bahrain

Belgium

Bulgaria

Cameroon

Canada

Cape Verde

Chile

Croatia

Denmark

Estonia

Finland

France

Gabon

Gambia

Georgia

Germany

Ghana

Greece

Iceland

Iraq

Ireland

Israel

Italy

Jordan

Liberia

Lithuania

Malta

Mauritania

Montenegro

Morocco

Mozambique

Netherlands

New Zealand

Nigeria

Norway

Poland

Portugal

Romania

Sao Tome & Principe

Senegal

Serbia

Singapore

Slovenia

Spain

Togo

Tunisia

Turkey

Ukraine

United Kingdom

United States

Yemen

Automatic Identification System (AIS)

Mandated by IMO

“to improve the maritime safety and efficiency of navigation, safety of life at sea and the protection of the marine environment”

IMO International Convention for the Safety of Life at Sea (SOLAS) Chapter V, Safety of Navigation, Regulation 19, 1974/1980



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Who is required to have AIS?

Per the IMO SOLAS Convention

- All passenger ships.
- All cargo ships ≥ 500 GT.
- Ships ≥ 300 GT on international voyages.

Does not apply to:

- Warships / Naval auxiliary.
- Vessels owned/operated by government and used on government non-commercial service.

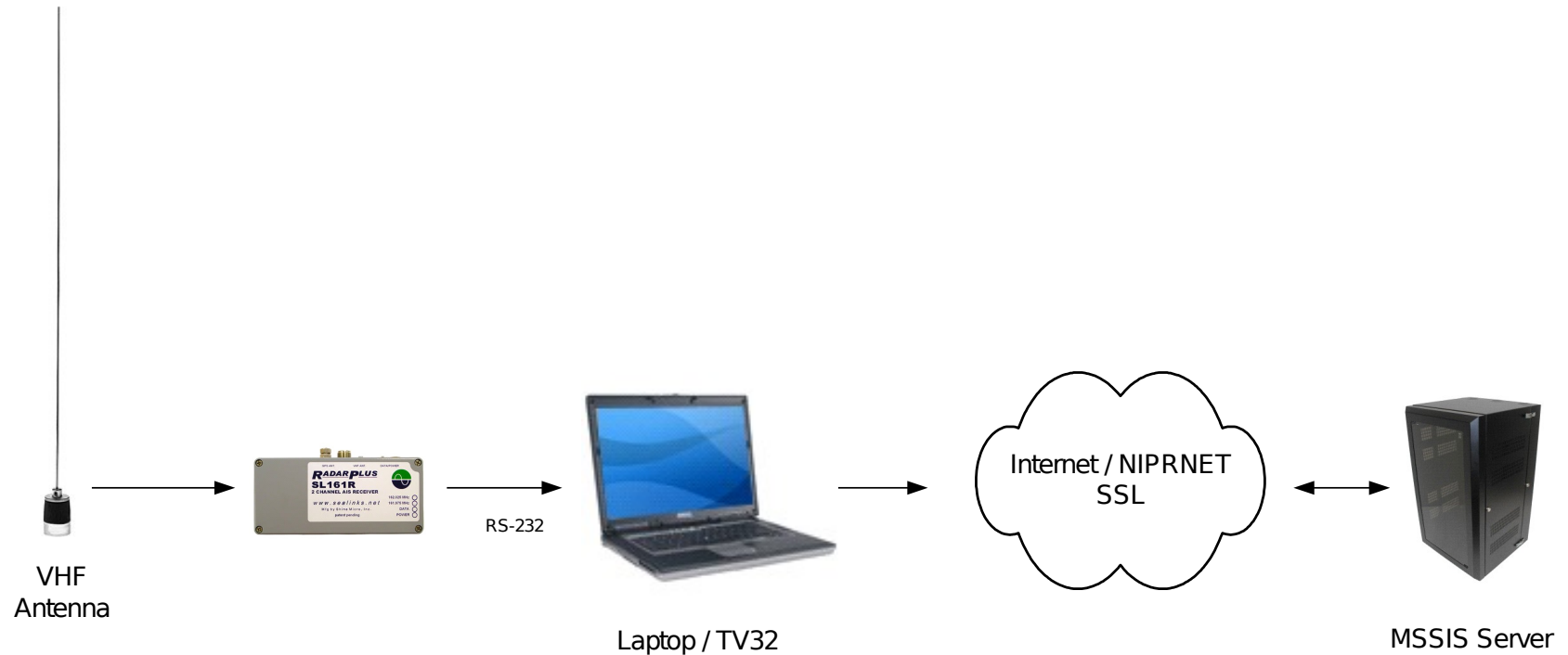
In U.S. Waters, a USCG amendment for Commercial vessels ≥ 65 feet.

Augmented in some cases by local regulations (as example, Singapore requires a transponder on any and all water craft).

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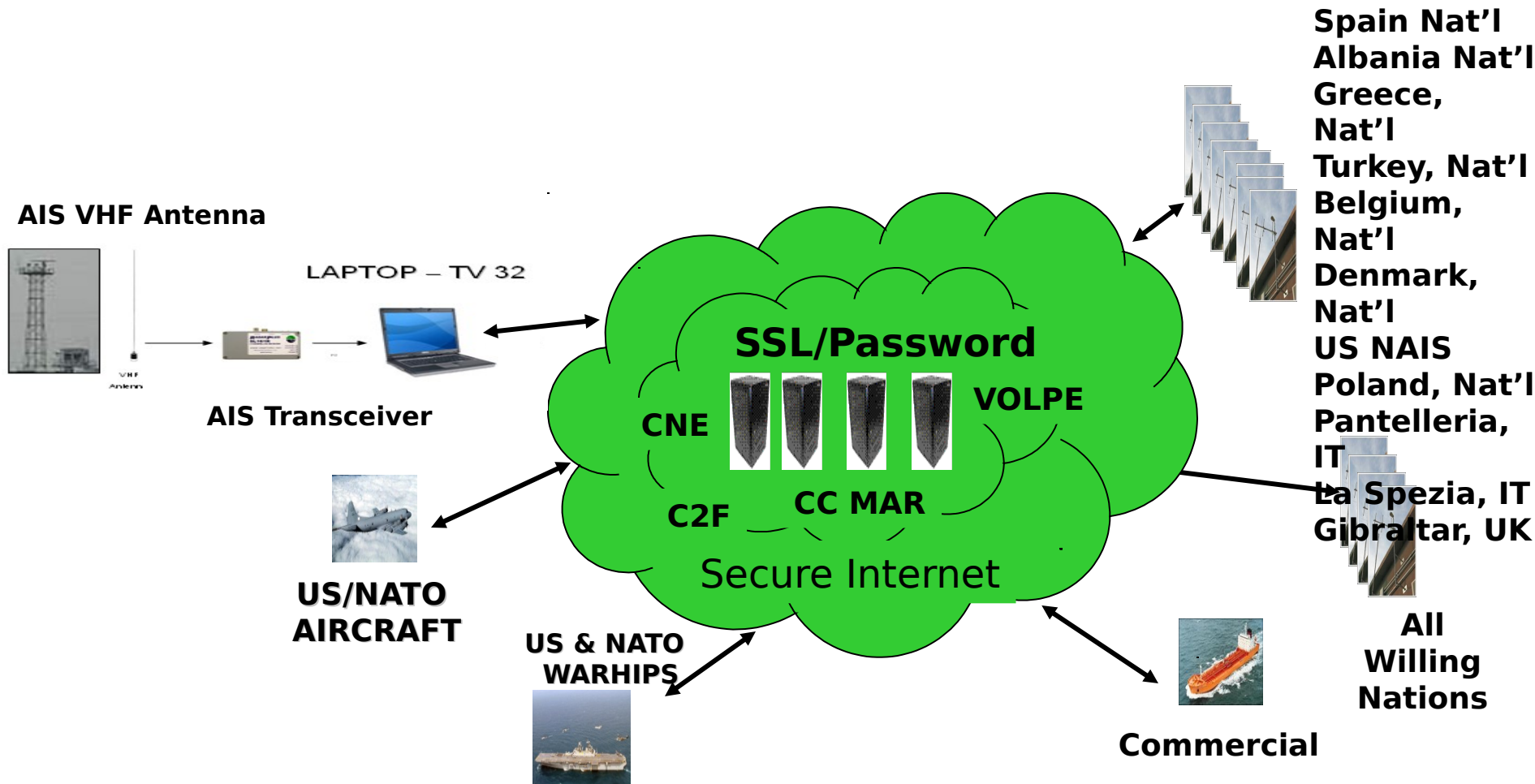
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Simple MSSIS - AIS Provider



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MSSIS Architecture



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MSSIS Server - Volpe Center

MSSIS Firewall/Router



AIS Collector (sources)



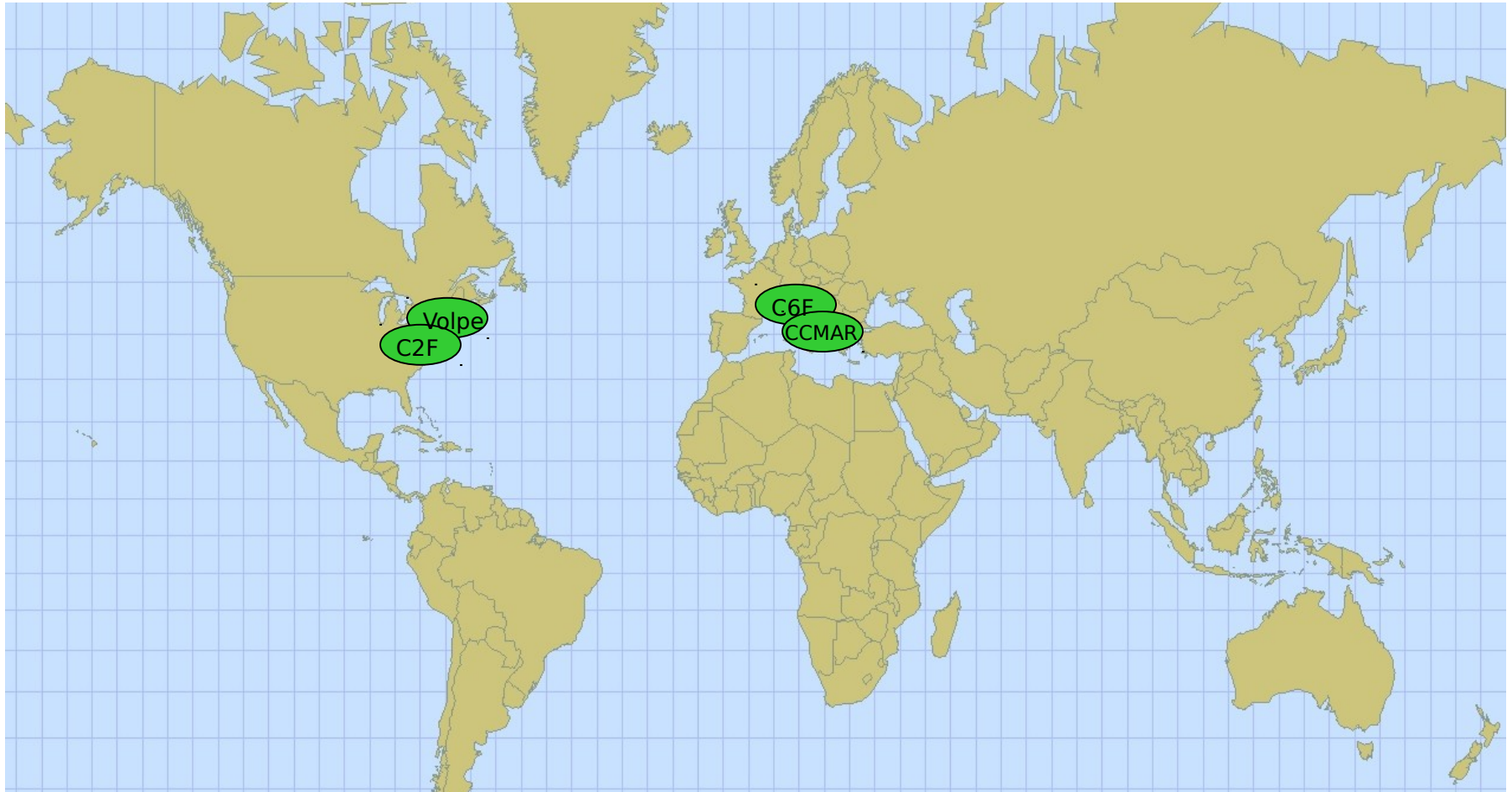
Data Thinner



AIS Distributor (clients)



MSSIS Server Locations



MSSIS Administration

Monitoring System
data rates across
multiple servers

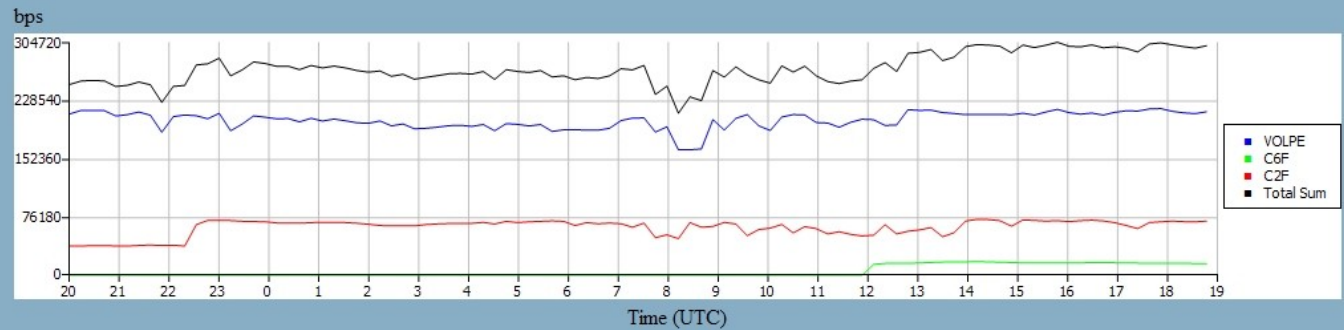
Total - Server Status Page

Collector - Users: 73 - Bits/Second: 296,488
Distributor - Users: 110 - Bits/Second: 4,576,374

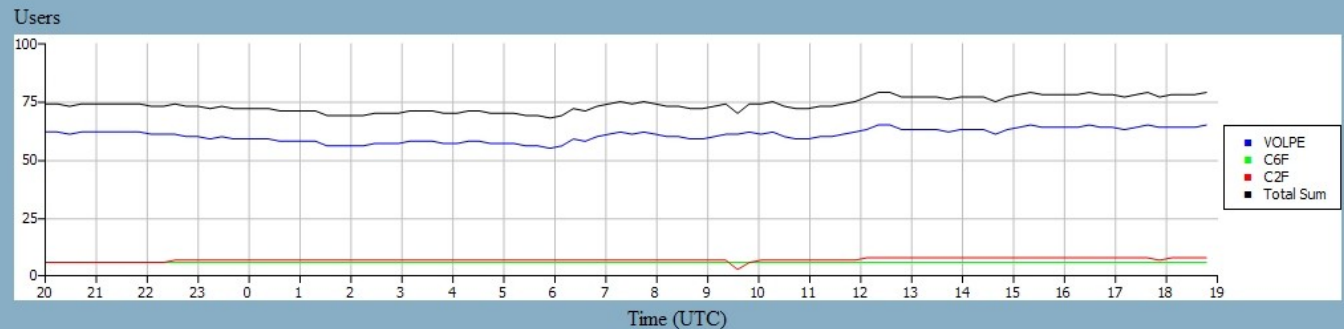
Color Key

■	C2F
■	C6F
■	Volpe

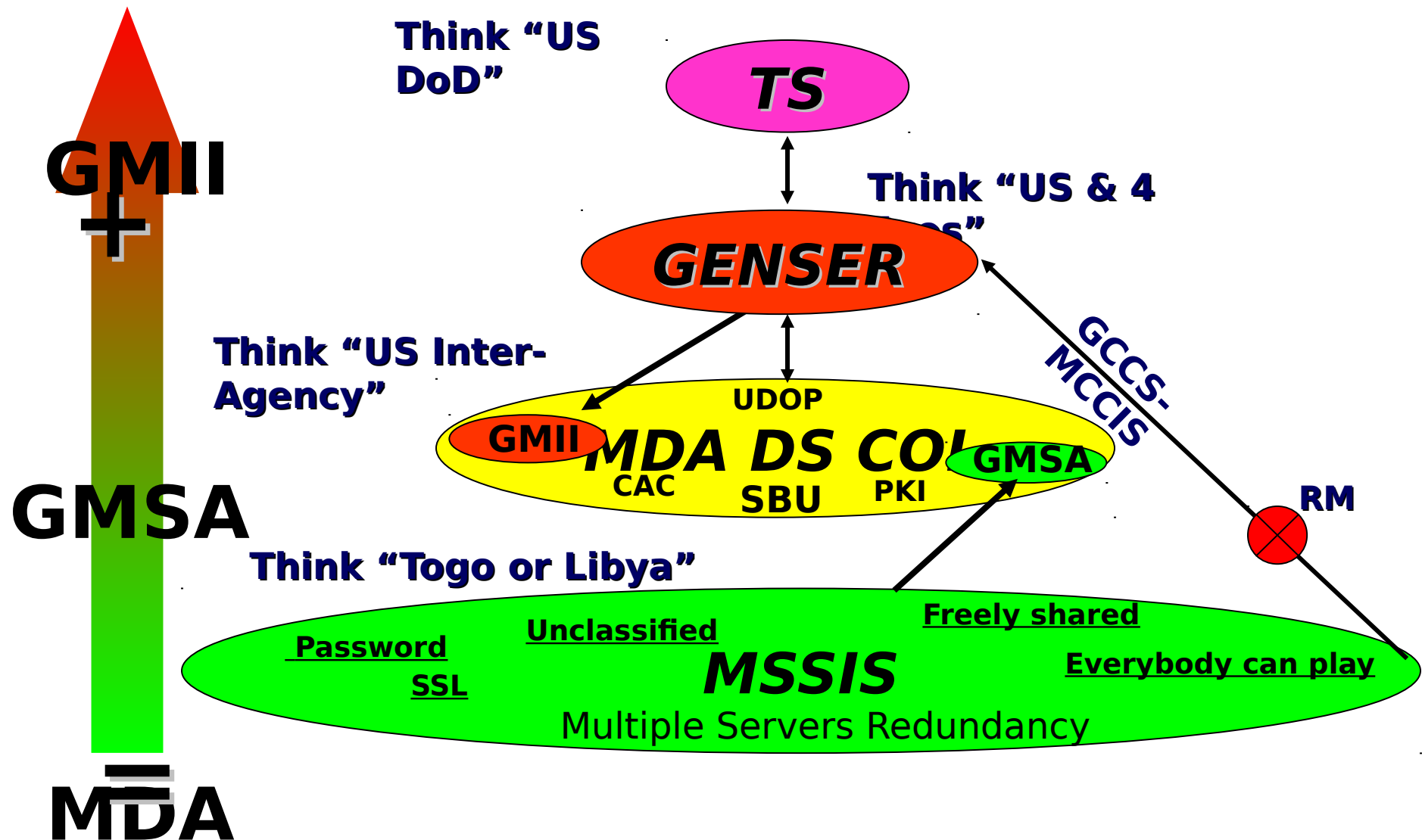
Total - Collector 24 Hr bits/second Trend



Total - Collector 24 Hr Users Connected Trend



How MSSIS Fits



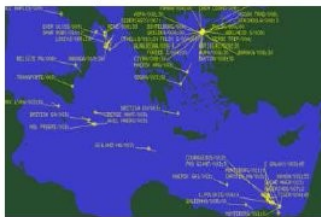
MSSIS role in NATO Operations



OAE EXECUTION



3 Ships = 60 Contacts



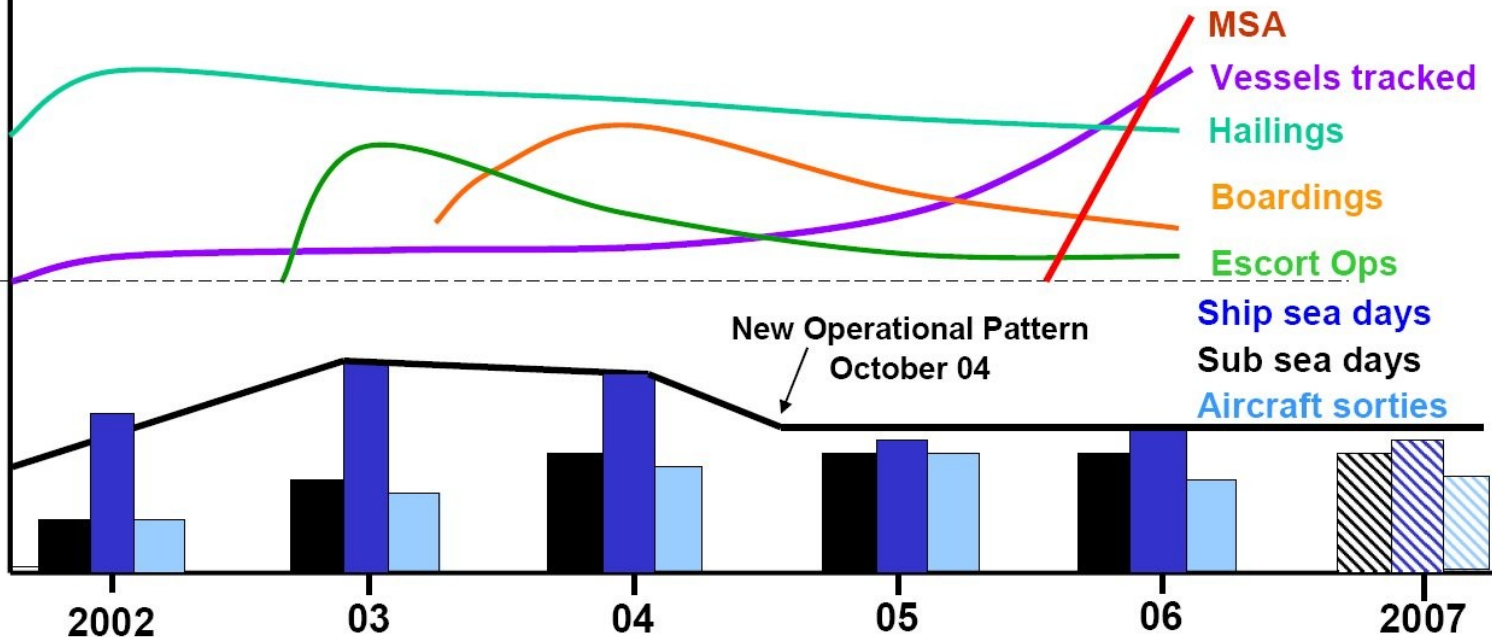
Networked Sensors = 5000 contacts

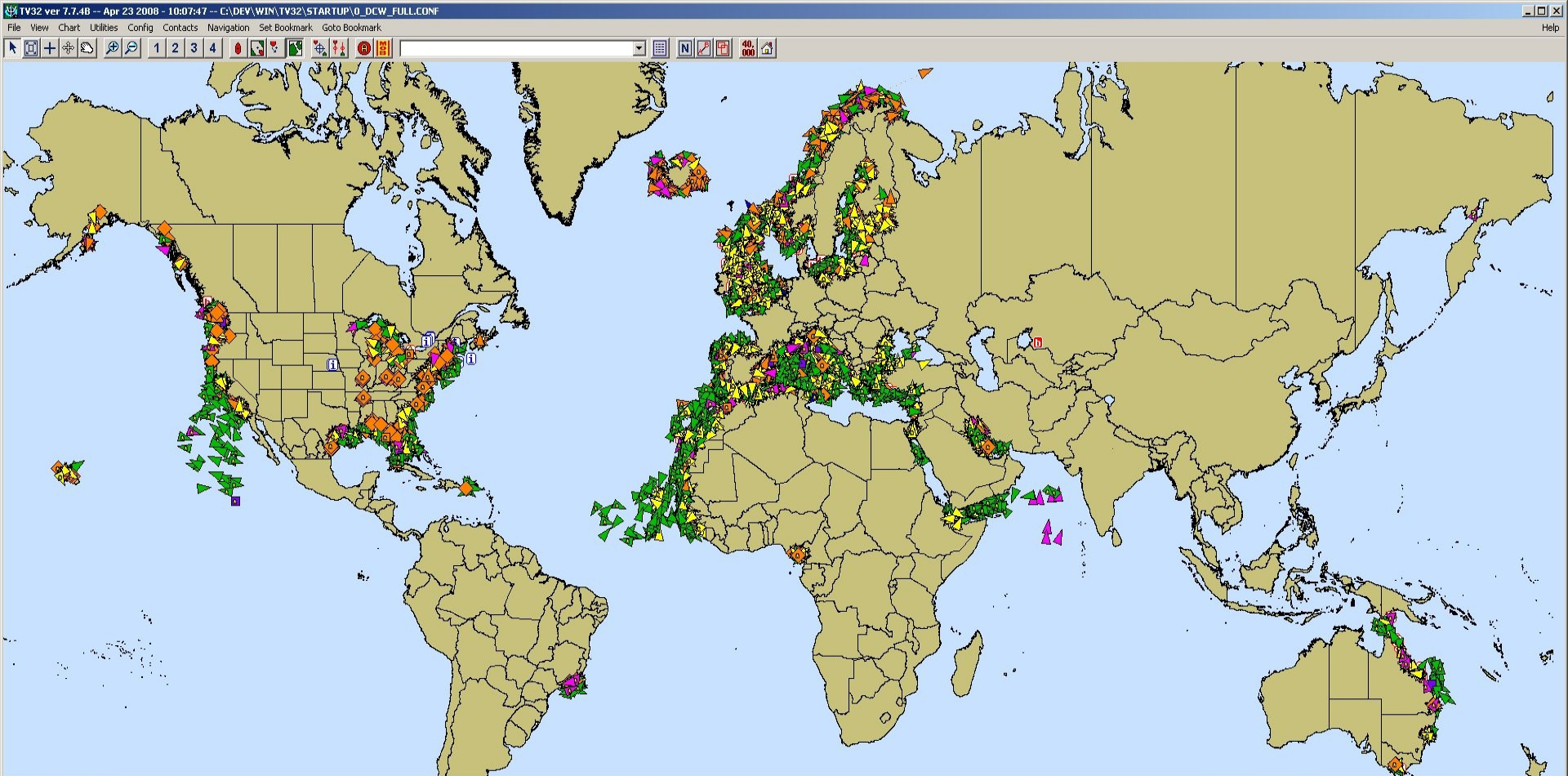


EFFICIENCY

ACTIVITIES

COMMITMENT





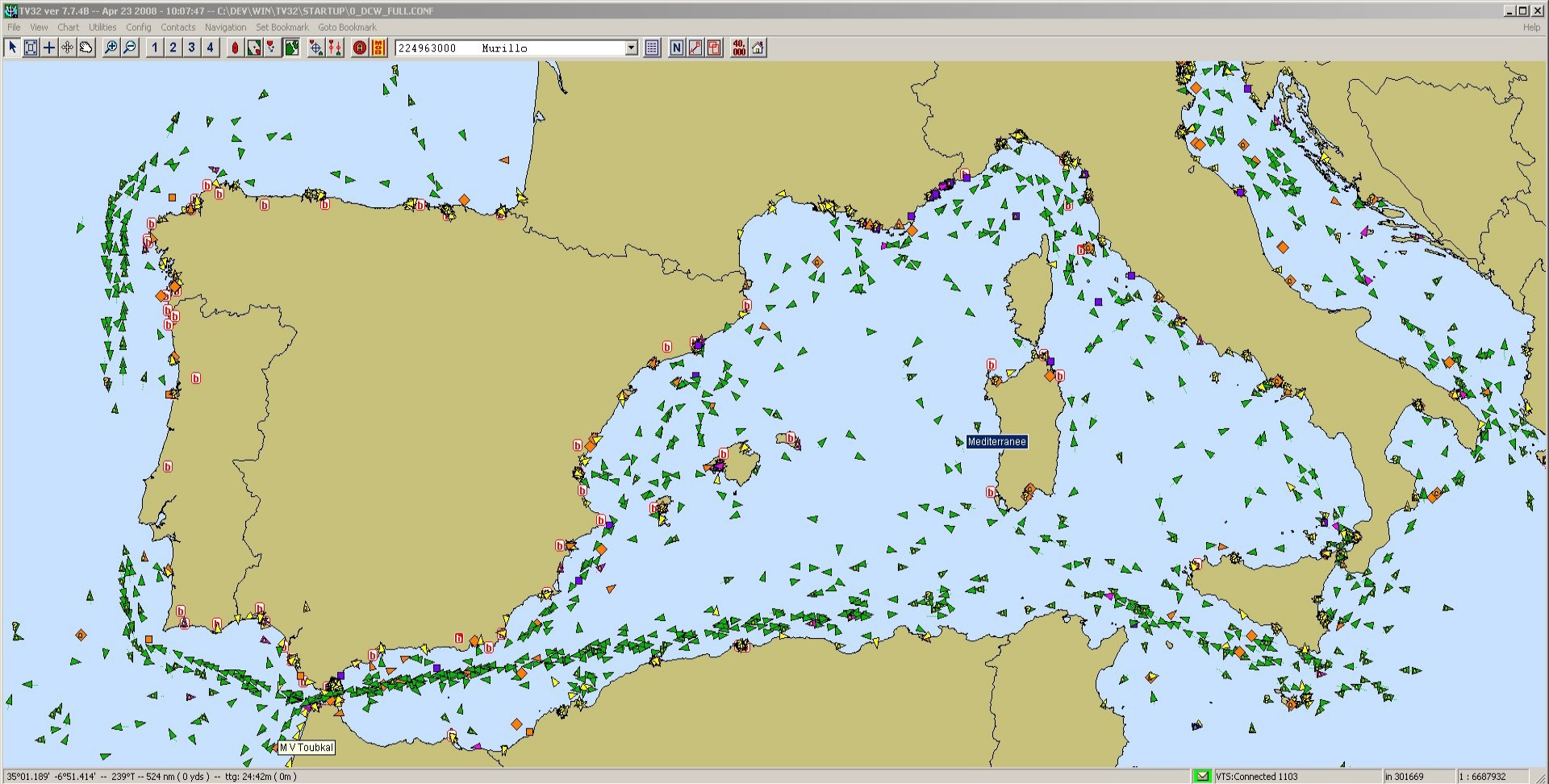
-17°08.09' -121°03.250'

VTS:Connected 1103 in 223237 1 : 80496123

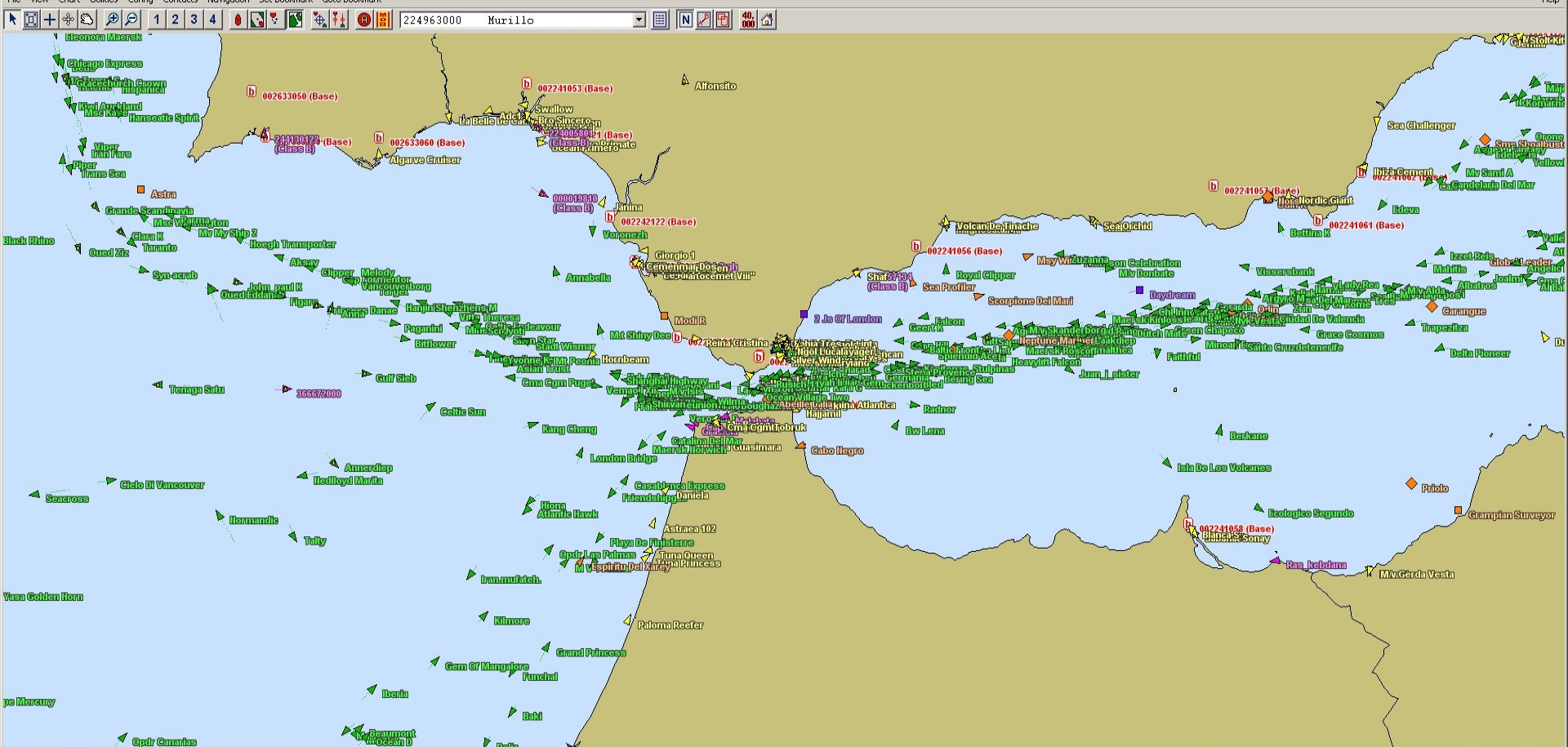
Vessel List

Vessel Name	Comms ID	IMO Num	Callsign	Type	Cargo	Destination	Dist ETA (UTC)	Nav Status	Lat	Lon	SOG(kts)	COG	Heading	(up) - (down)	W/VW Lookup	Rx Str
Usns Mount Ba...	368781000	8337053	NZHN	35-MidOps	0-AllShips			5-Moored	40°27'20	-74°03'16	0.0	0.1°T	27.0°T			323380001
Usns Antares	367185000	7226997	NPE1	7-Cargo	0-AllShips			5-Moored	30°24'00	-81°31'21	0.0	0.0°T	< 0°T >			123380002
Usns Apache Tal...	367946000	8832693	NIGP	52-Tug	0-AllShips	Charleston del...	03:02 - 13:00	5-Moored	32°51'51	-79°57'52	0.0	0.1°T	< 0°T >			323380001
Usns Big Horn	367964000	8812162	NBIG	9-Other	0-AllShips	Norfolk	00:00 - 24:00	0-Underway(Engine)	58°58'39	-51°52'29	9.6	349.3°T	363.0°T			192320004
Usns Bridge	338956000	0	NGMV	9-Other	9-NoInfo	Local_ops	00:00 - 00:00	5-Moored	47°58'56	-122°13'41	0.0	20.7°T	34.0°T			323380001
Usns Comfort	368817000	7390478	NCOM	58-Medical	0-AllShips		00:00 - 00:00	15-NoIDefined	39°15'32	-76°33'32	0.0	0.1°T	< 0°T >			323380001
Usns Kaiser	303849000	8302416	NHJK	8-Tanker	0-AllShips		00:00 - 24:00	5-Moored	32°42'22	-117°11'20	0.0	12.2°T	110.0°T			323380001
Usns Laramie	367861000	8906626	NLAR	35-MidOps	0-AllShips	There	00:00 - 00:00	5-Moored	36°52'57	-76°20'22	0.0	0.1°T	325.0°T			323380001
Usns Mercy	367816000	739045400	NMER	58-Medical	0-AllShips	Sea Trial	04:25 - 00:00	5-Moored	32°41'05	-117°08'06	0.1	319.3°T	< 319°T >			323380001
Usns Paul Buck	366705630	8220773	NBBO	8-Tanker	9-NoInfo		10:27 - 00:00	0-Underway(Engine)	40°51'31	2°12'20	13.5	282.0°T	285.0°T			192240001
Usns Pollux	368989000	7319632	NMVG	9-Other	0-AllShips		00:00 - 24:00	5-Moored	42°20'43	-71°01'48	0.1	194.8°T	< 190°T >			000006099
Usns Sisler	368734000	9117038	NZIX	7-Cargo	0-AllShips	Na	06:18 - 07:00	5-Moored	32°51'14	-79°57'07	0.0	0.0°T	53.0°T			323380001
Usns Sodeman	367819000	9232254	NANL	7-Cargo	9-NoInfo	Norfolk	12:21 - 10:00	5-Moored	36°51'54	-76°18'51	0.0	0.0°T	227.0°T			323380001
Usns Waters	367851000	9301988	NWAA	0-Unknown	Unknown	Port Hueneme	00:00 - 24:00	5-Moored	34°08'57	-119°12'23	0.0	0.0°T	139.0°T			323380001

Refresh In View 9380 Total 9382 ☐ List All Contacts ☐ Apply Filters Search usn ☐ Plot Bookmarks Only



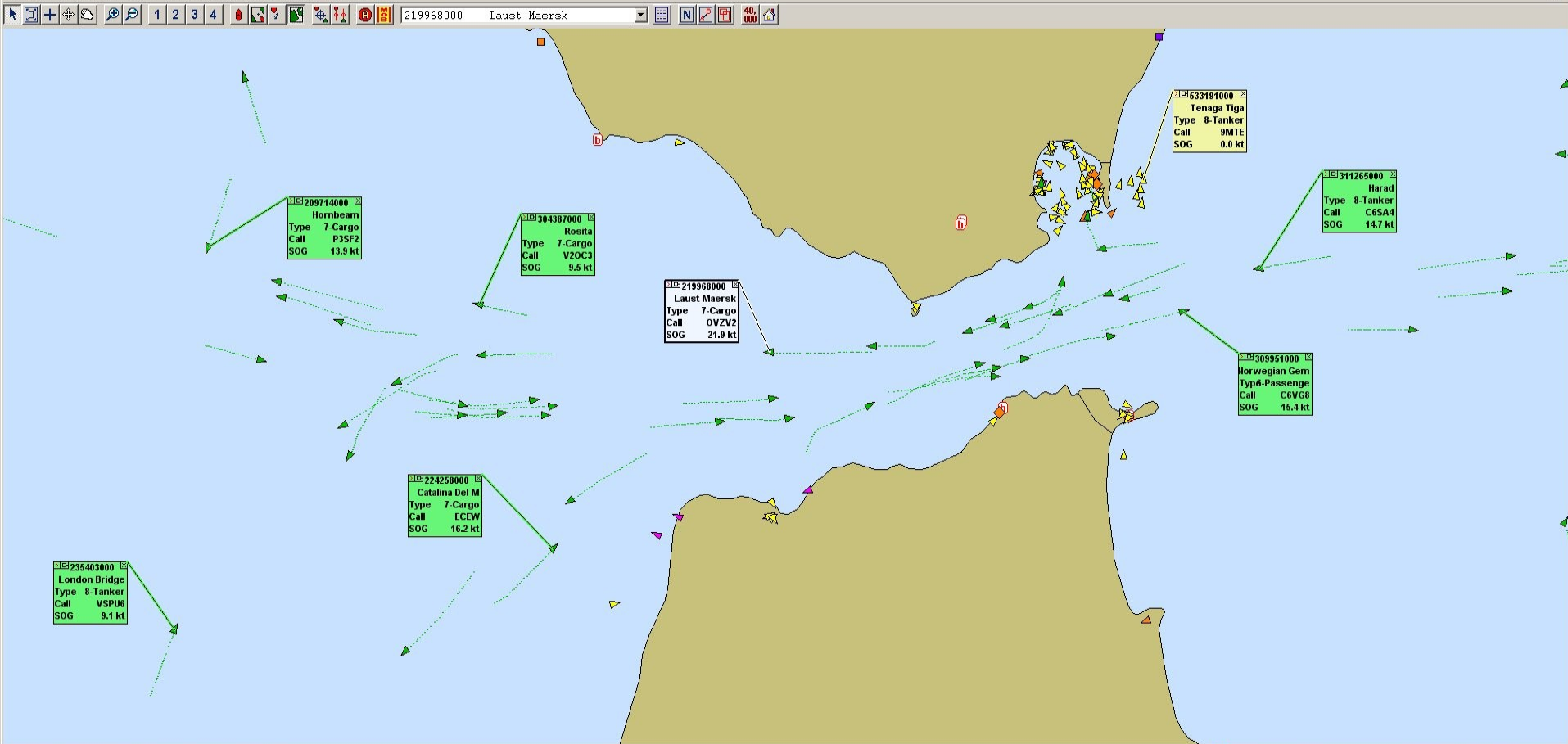
Vessel List																
Vessel Name	Comms ID	IMO Num	Callign	Type	Cargo	Destination	Dst ETA (UTC)	Nav Status	Lat	Lon	SOG(kts)	COG	Heading	(up) - (down)	W/VW Lookup	Rx Str
Andromeda	215089000	9045625	9HBY7	7-Cargo	0-AIShips	Tanger Moro...	04/21 - 08:00	5-Moored	35°47'16	-5°47'56	0.0	0.0°T	56.0°T			192240001
Costa Meditranee	247088200	9237345	IBCF	6-Passenger	9-NoInfo	Genova	04/28 - 04:30	0-Underway(Engine)	43°38'41	7°55'10	17.5	48.0°T	48.0°T			192260004
Grande Meditranee	247305000	9138393	IBFF	7-Cargo	9-NoInfo	Setubal	04/30 - 15:00	0-Underway(Engine)	43°43'17	8°11'22	18.6	233.0°T	234.0°T			192260009
M/V Andromeda	304626000	8205216	VZTK	7-Cargo	0-AIShips	Avonmount	05/02 - 13:00	8-Underway(Sailing)	36°49'27	0°16'40	8.4	260.0°T	265.0°T			192240001
Marviva Med	232541000	7347938	GYAR	9-Other	0-AIShips	Tarragona	12/18 - 08:00	5-Moored	41°06'34	1°14'36	0.0	262.7°T	13.0°T			192240001
Med Prodigy	304011013	8618059	V2PH9	7-Cargo	0-AIShips	Alger	04/29 - 17:00	0-Underway(Engine)	37°26'06	11°15'22	9.4	300.0°T	299.0°T			162470002
Med Qualtro	247003900	7340643	IKMN	9-Other	0-AIShips			8-Underway(Sailing)	42°13'52	14°52'38	0.0	0.0°T	301.0°T			162470002
Med Sei	247076800	7404839	IZME	52-Tug	0-AIShips	Ravenna	04/25 - 12:00	5-Moored	44°27'55	12°15'49	0.0	0.0°T	18.0°T			162470002
Medal	225370000	9397638	EBY1	7-Cargo	9-NoInfo	Setubal	04/28 - 00:30	0-Underway(Engine)	36°00'28	-5°27'15	9.9	250.5°T	251.0°T			192360001
Medi Roma	247162400	9233521	IBRM	7-Cargo	0-AIShips	Santos	05/13 - 05:00	0-Underway(Engine)	41°03'00	3°52'16	14.3	230.0°T	231.0°T			192240001
Meditranee	227187000	8705395	FNYP	6-Passenger	0-AIShips			8-Underway(Sailing)	39°54'23	7°37'46	22.4	331.0°T	329.0°T			192240001
Mv Mamulmed	271000030	8332100	TCK1	7-Cargo	0-AIShips	Algiers	04/18 - 12:00	1-AAnchor	36°45'55	3°06'27	0.0	119.0°T	< 318°T >			192240001
Normed Amsterdam	256508000	9347621	9HwD8	7-Cargo	9-NoInfo			5-Moored	44°24'22	8°53'14	0.0	172.0°T	172.0°T			162470002
Normed Izmir	305188000	9259068	VZDE7	7-Cargo	0-AIShips	Gijon	04/26 - 10:00	5-Moored	43°33'52	-5°41'50	0.0	317.7°T	246.0°T			192240001
[Refresh] [In View] [2388] [Total] [9952] [List All Contacts] [Apply Filters] [Search] [med] [Bookmark Selections] [Plot Bookmarks Only]																



37°29.011' -4°38.708' -- 248°1' -- 356 nm (0 yds) -- tlg: 16:55m (0m)

Vessel List																		
Vessel Name	Comms ID	IMO Num	Callign	Type	Cargo	Destination	Dst ETA (UTC)	Nav Status	Lat	Lon	SOG(kts)	COG	Heading	(up) - (down)	W/VW Lookup	Rx Str		
Eleonora Maersk	220477000	9321500	OVX/P2	7-Cargo	1-HazCatA	Algeciras	04/28 - 16:00	0-Underway(Engine)	37°35'04	-9°47'18	19.1	167.6°T	168.0°T			192630014		
Laut Maersk	219966000	9190743	OVZV2	7-Cargo	0-AISShps	Maas Pilot	05/01 - 00:30	0-Underway(Engine)	35°57'40	-5°43'46	21.4	270.0°T	270.0°T			192240001		
Leda Maersk	219973000	9190755	OVZ22	7-Cargo	0-AISShps	Montevideo	05/08 - 08:00	0-Underway(Engine)	35°55'00	-6°19'09	20.8	239.0°T	240.0°T			192240001		
Maersk Jennings	636091507	9399753	ABOU5	7-Cargo	9-NoInfo	Algeciras	04/28 - 06:00	5-Moored	36°08'10	-5°26'09	0.0	183.0°T	183.0°T			192240001		
Maersk Kelso	235057944	9333008	MYJU	7-Cargo	0-AISShps	Algeciras	04/26 - 22:00	1-AtAnchor	36°09'20	-5°24'25	0.0	168.4°T	323.0°T			192240001		
Maersk Kinloss	235059342	9333022	2AGF2	7-Cargo	0-AISShps	Algeciras	04/29 - 08:00	0-Underway(Engine)	36°17'23	-3°28'13	15.1	260.0°T	264.0°T			192240001		
Maersk Kolkata	237863000	9244922	SZHN	7-Cargo	9-NoInfo	Algeciras [spain]	04/27 - 16:00	5-Moored	36°08'44	-5°26'08	0.0	182.0°T	182.0°T			192240001		
Maersk Mayland	235057763	9007829	MXAR	7-Cargo	0-AISShps	Algeciras	04/26 - 07:00	1-AtAnchor	36°05'19	-5°24'39	0.1	331.7°T	52.0°T			192360001		
Maersk Norwich	565213000	9301926	9VEK9	7-Cargo	0-AISShps	Dakar	05/01 - 00:00	0-Underway(Engine)	35°41'29	-6°14'39	21.0	218.0°T	220.0°T			192240001		
Maersk Roscoff	246386000	9136228	PHHV	7-Cargo	1-HazCatA	Valencia	04/24 - 28:10	0-Underway(Engine)	36°08'36	-4°00'15	18.8	81.0°T	77.0°T			192240001		
Thies Maersk	219336000	8819990	0XIF2	7-Cargo	9-NoInfo	Tangier Med	04/27 - 20:00	5-Moored	35°53'22	-5°29'53	0.1	211.7°T	43.0°T			192360001		

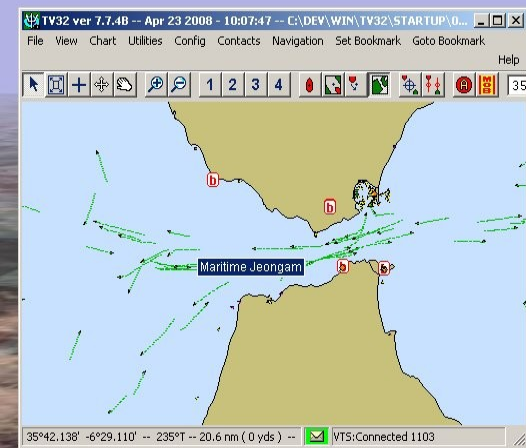
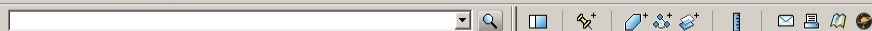
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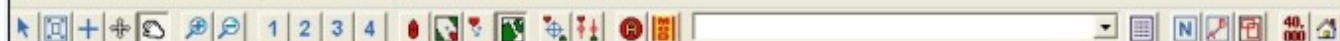


35°53.658' -4°53.690' -- 95°T -- 44.4 nm (0 yds) -- ttp: 2:01m (0m)

Vessel List																			
Vessel Name	Comms ID	IMO Num	Callsign	Type	Cargo	Destination	Dst ETA (UTC)	Nav Status	Lat	Lon	SOG(kts)	COG	Heading	(up) -- (down)	W/VW Lookup	Rx Str			
Al Marrouna	311468000	9325685	C6VF5	8-Tanker	1-HazCatA	Port Said	05/02 - 18:00	1-AtAnchor	36°07'34	-5°22'55	0.1	237.2°T	334.0°T			192240001			
Catalina Del Mar	224258000	8513780	EECV	7-Cargo	0-AllShips	Barcelona	04/29 - 12:00	0-Underway(Engine)	35°44'35	-6°06'47	16.2	46.0°T	49.0°T			192240001			
Chem Mangold	215930000	9065170	9HCD8	8-Tanker	0-AllShips	Algeciras	06/03 - 20:08	1-AtAnchor	36°10'24	-5°25'09	0.0	256.0°T	65.0°T			192240001			
Gemmar Kara G	636013098	9302994	ABK08	8-Tanker	0-AllShips	Cartagena Sp...	04/29 - 06:00	0-Underway(Engine)	35°58'35	-5°22'01	17.2	84.0°T	86.0°T			192240001			
Maersk Mayland	235057763	9007829	MXAR	7-Cargo	0-AllShips	Algeciras	04/26 - 07:00	1-AtAnchor	36°05'18	-5°24'39	0.1	331.7°T	45.0°T			192240001			
Mar Isa	224989000	9260500	ECBV	8-Tanker	0-AllShips	Algeciras	04/27 - 05:00	1-AtAnchor	36°10'38	-5°24'01	0.0	0.0°T	85.0°T			192240001			
Mar Maria	224983000	9260495	ECBP	8-Tanker	9-NoInfo	Ceuta	04/27 - 17:00	0-Underway(Engine)	35°53'55	-5°19'21	0.0	0.0°T	90.0°T			192240001			
Maritime Jeongam	353673000	9237113	HODD	7-Cargo	0-AllShips	Vado Ligure Italy	04/30 - 17:00	0-Underway(Engine)	35°53'48	-6°11'18	13.1	86.6°T	85.0°T			192240001			
Princessa Guasim...	372638000	9442237	3EJX4	7-Cargo	0-AllShips	Tanger morocco	10/04 - 17:00	1-AtAnchor	35°41'53	-6°00'53	0.2	123.0°T	74.0°T			192240001			
Salmarine Concord	244660000	8708543	PBFY	7-Cargo	1-HazCatA	Algeciras	04/27 - 08:00	5-Moored	36°08'26	-5°26'09	0.1	251.3°T	182.0°T			192240001			
Salmarine Illovo	636090906	9204972	ABHJ8	7-Cargo	9-NoInfo	Gibraltar	04/17 - 11:00	5-Moored	36°07'33	-5°21'20	0.0	203.0°T	< 291°T >			192360001			
Salmarine Saloum	304879000	9327578	VZB04	1-Reserved	5-Reserved	Algeciras	04/26 - 02:30	1-AtAnchor	36°08'55	-5°26'12	0.1	178.0°T	271.0°T			192240001			
Refresh	In View	156	Total	10496	<input type="checkbox"/> List All Contacts	<input type="checkbox"/> Apply Filters	Search	mar	Bookmark Selections	<input type="checkbox"/> Plot Bookmarks Only									

Refresh In View 156 Total 10496 List All Contacts Apply Filters Search mar Bookmark Selections Plot Bookmarks Only





Safety Text Messages

Message	Source	Dest	Time (UTC)
ship entered to restricted area	002470038	247055600 - Dellino Gili...	01/16 - 06:2
be advise that my ice prince is sinking in position 5009.9n 00202.1w large bert...	002275200	273119500 - Ivan Ryabov	01/16 - 06:3
be advise that my ice prince is sinking in position 5009.9n 00202.1w large bert...	002275200	211230400 - Rebecca ...	01/16 - 06:5
be advise that my ice prince is sinking in position 5009.9n 00202.1w large bert...	002275200	234460000 - Isarstem	01/16 - 06:5

Send ☐ Broadcast to All ☐ Repeat [3 min] To: [232647000] [232647000]: Patricia ☒ Show All Messages

Video - Breaking News Videos from CNN.com - Microsoft Internet Explorer

File Edit View Favorites Tools Help

CNN Video

Live Video

Podcasts



Ship faces turbulent seas 2:03
High winds, crashing seas and a storm threaten to capsize

Source: ITN
Added On January 15, 2008



Cosco Busan

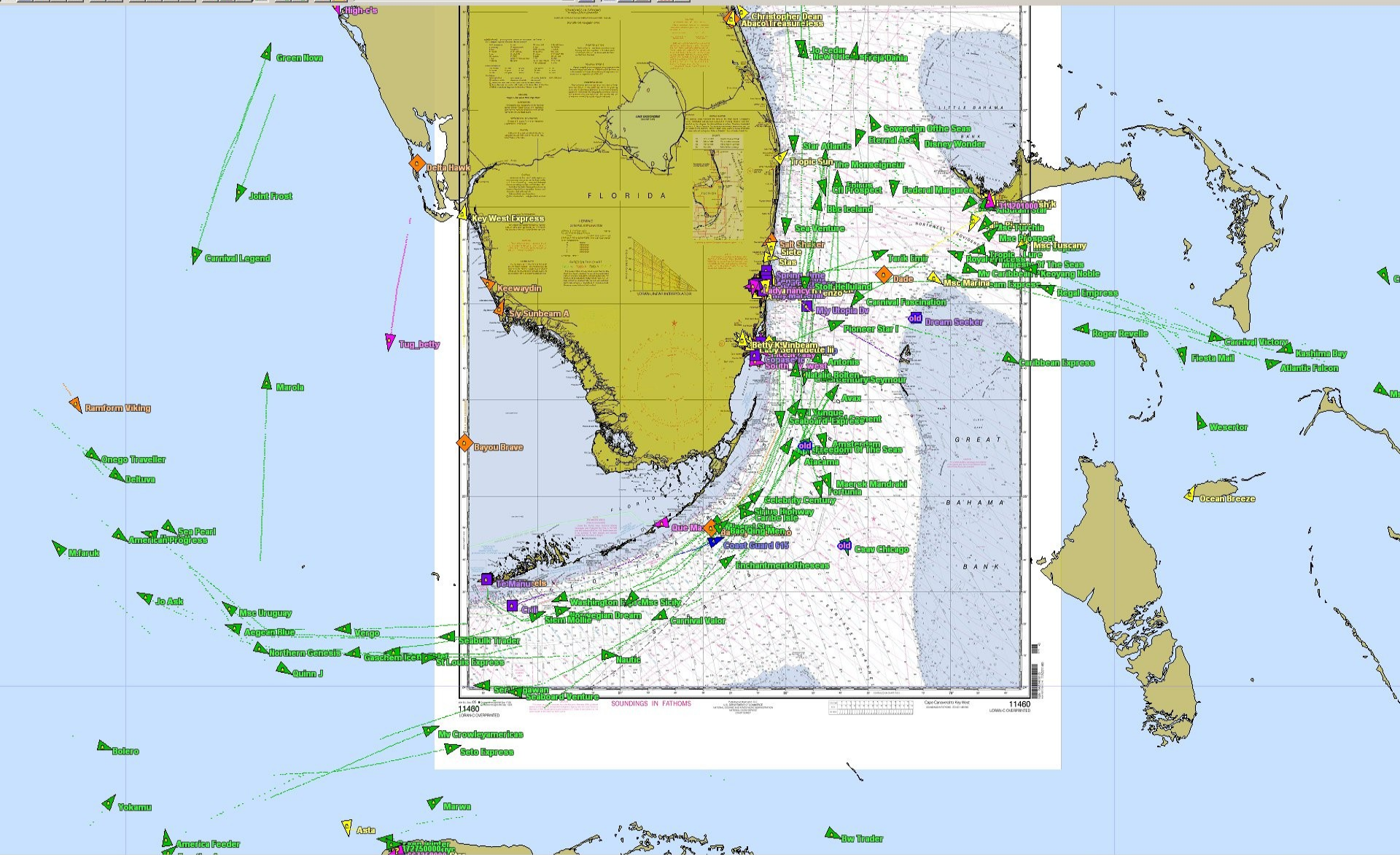


MMSI	477968900
IMO Num	9231743
Callsign	VRDI6
Type	7-Cargo
Destination	Pusan S Korea
ETA	11/15 - 22:00
Status	0-Underway(Engine)
SOG / COG	9.2 kts / 304
Report Time	16:29:58 (UTC)
Size	275m x 40m x 12.3m

[TV32 Supplied Webpage](#)
[USCG Maritime Information Exchange](#)
[Shipspotting \(photos\)](#)

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Carnival Fascination



MMSI	309682000
IMO Num	9041253
Callsign	C6PM9
Type	6-Passenger
Destination	
ETA	
Status	5-Moored
SOG/COG/HDG	0.0 kts / 295 / 295
Report Time	11:18:52 (UTC)
Size	261m x 32m x 7.9m

[TV32 Supplied Webpage](#)
[USCG Maritime Information Exchange](#)
[Shipspotting \(photos\)](#)

Other ships marked on the map: Itasca, Majesty Of The Seas, Celebrity Century, Ann Moran, Eternal Ace, Coalition Warship, Coastal Miami.

TV32 ver 7.7.4B -- Apr 29 2008 - 18:55:42 -- C:\DEV\WIN\TV32\STARTUP\0_BSB_DCW_N...
File View Chart Utilities Config Contacts Navigation Set Bookmark Goto Bookmark Help

33°36.012' -96°55.594' -- 302°T -- 991 nm (0 yds) | VTS:Disconnected 1103 | in 321E

Image © 2008 Sanborn
© 2008 Sanborn

Pointer 25°46'50.38"N 80°09'31.29"W elev 0 ft

Streaming [|||||||] 100%

Eye alt 9042 ft

Google

The value of MSSIS has been demonstrated both in terms of CNE-C6F operations and NATO's Operation Active Endeavour. In several cases, high interest vessels were located and tracked using the network. The ability to share this information enabled us to work the end game with national authorities where we otherwise would have been unable to investigate a suspicious vessel. MSSIS has enabled seizures of contraband and illegal immigrants, as well as rescues at sea.

MSSIS represents a repository of trust, and this trust is what keeps nations in the network. And while we seek to share the burden of running it, all of the participants look to us for the leadership and ideas to develop it further. We must be careful not to shortchange this role, allow MSSIS to degrade, or give the impression that we value classified and bilateral arrangements over unclassified multilateral exchange, as it would be perceived as a betrayal of trust and set back our efforts to build maritime partnerships.

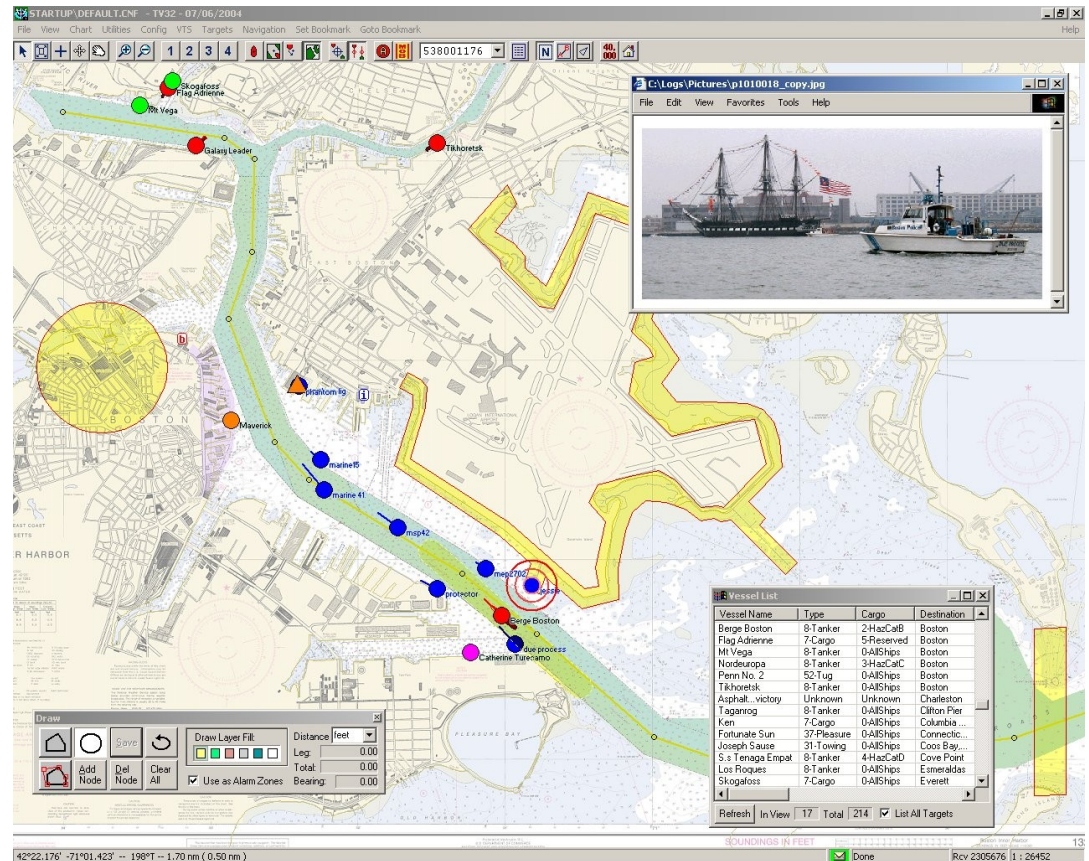
Excerpt from Admiral Ulrich, Commander U.S. Naval Forces Europe, letter to Admiral Roughead, Chief of Naval Operations

October 2007

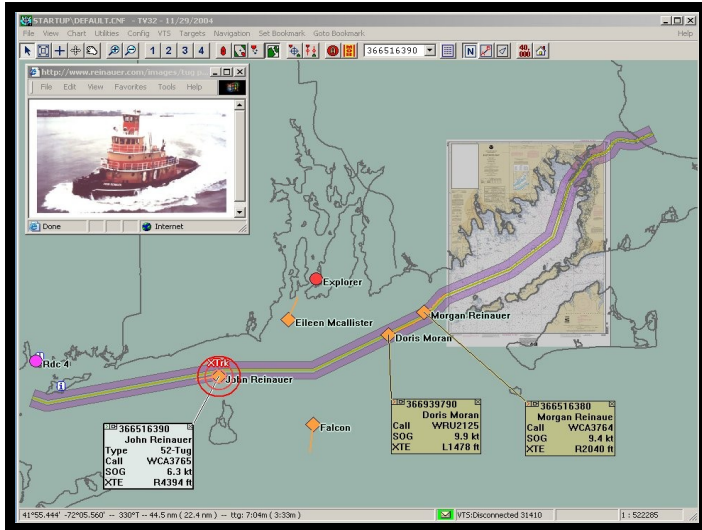
Transview (a.k.a TV32)

TV32 is a windows application developed by the Volpe Center for use in a number of vessel tracking and navigation related projects. Currently, it is used as the primary communications and chart display client for the MSSIS network and is generally provided for free as Government-off-the-shelf (GOTS) software. It has been used for:

- Pilot Navigation
- Vessel Traffic Management
- Oil Spill Modeling
- Accident Investigation
- Buoy Positioning
- Network Monitoring
- Analysis Tool
- Data Logging
- Data Translation/Exchange
- Port/Harbor Security
- Force Protection Display

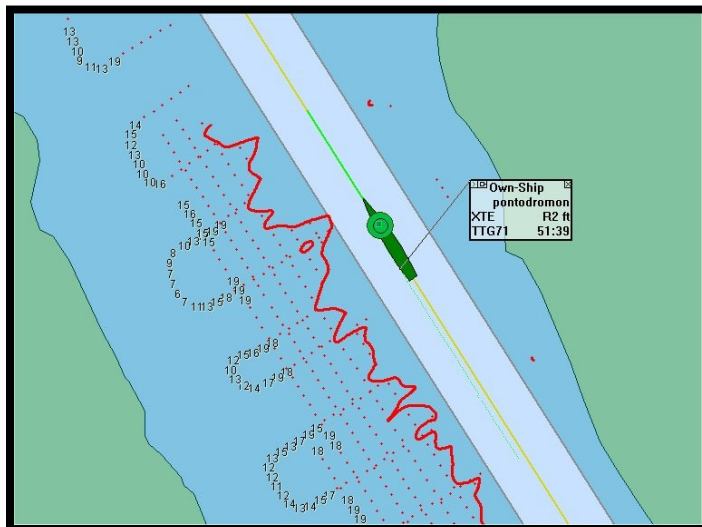


Transview Other Applications:



Cape Cod Canal

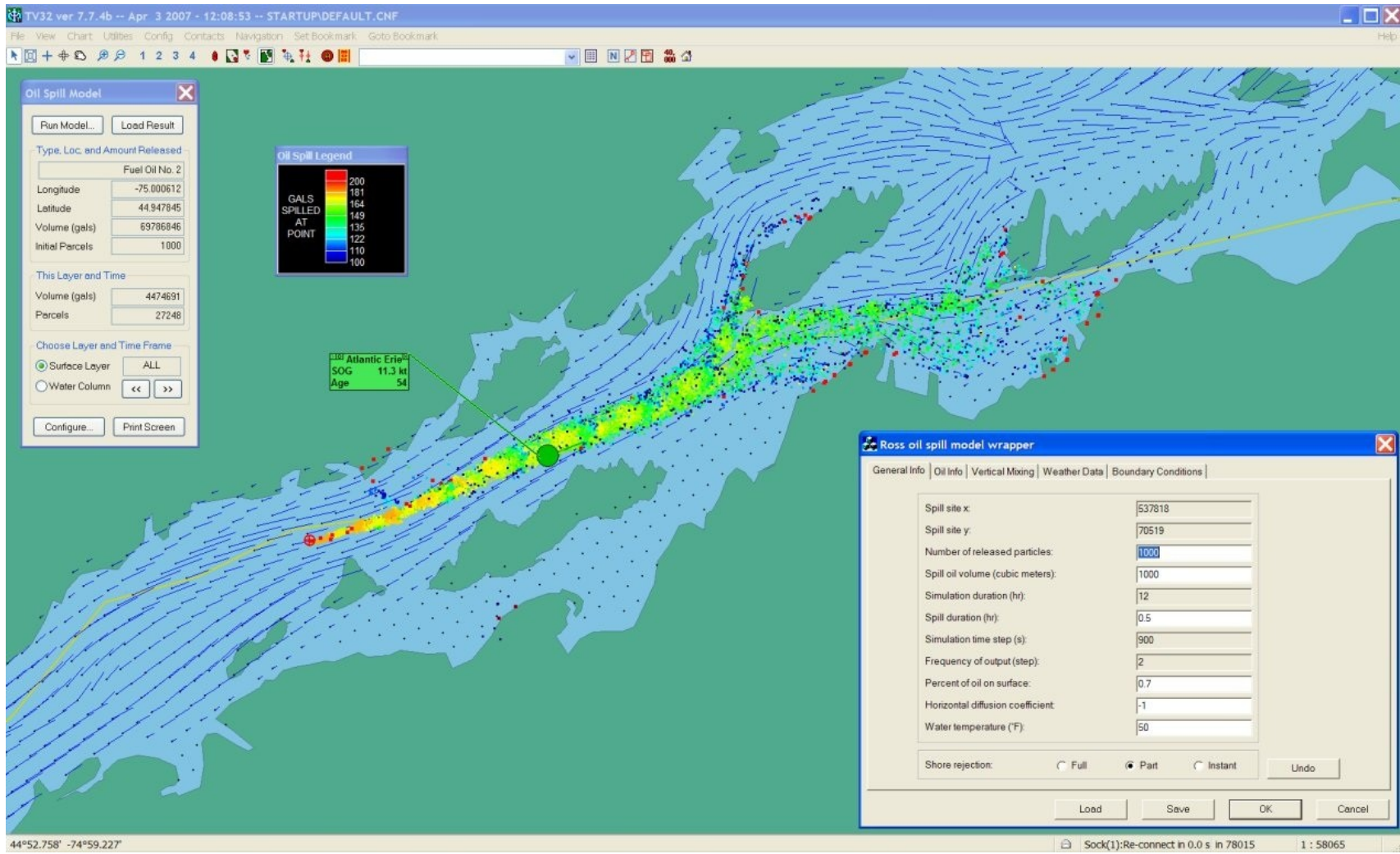
- Army Corp of Engineers
- Oil Spill Prevention

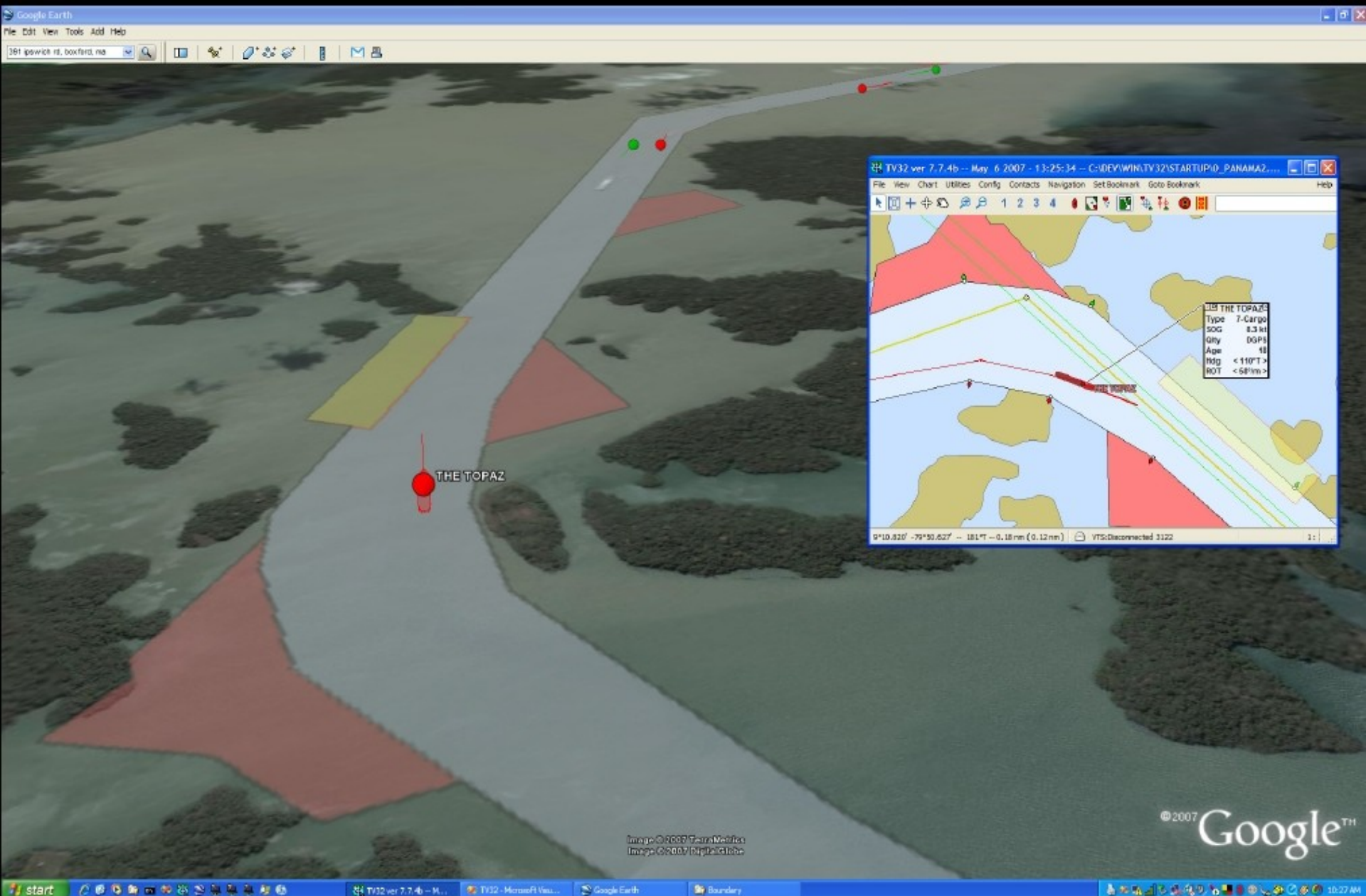


Columbia River Pilots

- Pilot Display
- Hydro Graphic Survey

Transview Other Applications: Oil Spill Model





MSSIS Future Vision

MSSIS+, AIS, Radar, ADSB, ...

TV32 ver 7.7.4b -- Aug 20 2007 - 16:42:32 -- C:\DEV\WIN\TV32\STARTUP\0_BSB_DCW_NORTH_AMERICA.CONF

File View Chart Utilities Config Contacts Navigation Set Bookmark Goto Bookmark

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



Pink Circles are
radar contacts
from Pilot
launch

Airplane icons
are from ADSB

